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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,608	06/26/2003	Gordon Kenneth Andrew Oswald	1418-37	2888

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EXAMINER	
ALSOMIRI, ISAM A	

ART UNIT	PAPER NUMBER
3662	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/603,608	OSWALD ET AL.	
	Examiner	Art Unit	
	Isam Alsomiri	3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *57-116* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *63,72,78-83 and 116* is/are allowed.

6)☒ Claim(s) *57-62,64-68,70,73,74,84-98 and 101-115* is/are rejected.

7)☒ Claim(s) *69,71,75-77,99 and 100* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/203,547.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 57-62, 64, 66-68, 85-93, 98, 101-107, 109, 113-115 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729 in view of Wu et al. US006493380B1.

Re claim 57, 85-86, 98, 113-115, Oswald discloses in figures 5-7, Apparatus for obtaining positional information relating to an object (see figure 4), comprising: means for transmitting a probe signal towards the object, said transmitting means comprising a transmitting element; means for receiving, at a plurality of spaced apart locations (see figure 7), the probe signal as returned by the object, said receiving means comprising a plurality of receiving element forming an antenna array (102, 104, 106), and detecting means, coupled to the receiving means, for detecting the relative timing of the returned probe signals as received at the plurality of spaced apart locations (see figures 4-7, Abstract); whereby the positional information for the object can be determined from said relative range measurement (inherent using at least two receivers, in this case figure 7, three receivers); and wherein the transmitting element and receiving elements are disposed within a single housing or on a common substrate (see figure 7, all antennas on a single substrate).

Oswald is silent about the receiving elements are spaced apart by distance that is the same order of magnitude as the wavelength λ of the radiation that it is intended to transmit and receive, which depend on the area. However, having the spacing between the elements of the receiving array equals to the radiation is well known and is obvious to include in Oswald system. Therefore, It would have been obvious to modify Oswald to have the receiver spaced apart by 1 or 2 wavelength depending on the use of the system phase ambiguity, range of the target, and so on.

Oswald is silent about measuring the relative timing between the detected timings to determine angular position information. Oswald teaches triangulation to determine angular position information, wherein the distance from the target to each receiver is determined and the difference between the measurements determine the exact location (see pages 20-21). Both techniques are very similar if not the same if you consider the distance is proportional to the time of arrival; Δd (d = distance) between two receivers is proportional to the Δt (t = time, relative time). However, even if both methods are different, determining relative timings between different sensors is well known; Wu teaches locating a wireless device using time difference of arrival (TDOA, which is the same as the claimed "relative timing") as a triangulation method to locate the wireless device (see col. 2 line 58 – col. 3 line 3). It would have been obvious to modify Oswald's system to use the TDOA method for determining the location as an alternative way to determine the location of the target.

Referring to claim 58, Oswald discloses in figure 7 the device is adapted to be contained within a single housing.

Referring to claim 59, Oswald discloses in figure 7 the processing means and the antenna array are constructed as a single assembly (see figure 3).

Referring to claims 60, 108, it's inherent that the processing means operates to provide all functional electrical signals to and receive all functional electrical signals from the array (see figure 3).

Referring to claims 61 and 84, Oswald discloses in figure 7 at least three receiving elements arranged non-collinearly (102, 104, 106); furthermore, the receiving elements are arranged substantially at the vertices of a right angle triangular locus.

Referring to claim 62, Oswald discloses in figure 7 the at least three receiving elements are arranged such that there is no axis about which the array is symmetrical.

Referring to claim 64, Oswald discloses the spacing of two pairs of the receiving element in a common direction is unequal (see figure 7); it is inherent that their sensitivity patterns will be dissimilar due to at least the difference in the their separations.

Referring to claim 66, Oswald teaches the receiving elements are substantially the same (see figure 3 R x n).

Referring to claim 67, it's inherent the transmitting element and receiving element have substantially the same field of view (see figure 7).

Referring to claim 68, Oswald discloses the spacing of two pairs of the receiving element in a common direction is unequal (see figure 7).

Referring to claim 87, Oswald is silent about the peripheral size of the antenna being 10 cm x 12 cm. However, having such size is well known, and is obvious to

include in Oswald's system. Furthermore, the antenna is not the applicant's invention, so the antenna with the claimed size can be used depending on the detection capability desired.

Referring to claims 88 and 93, Oswald teaches a processing stage operable to detect the interval (triangulations) between a signal being received by a first set of any two or more of the receiving elements and to determine a first angular position of an object from which the transmitted signal has been reflected; and to determine the interval between a signal being received by a second set of any two or more of the receiving elements and to determine a second angular position of an object from which the transmitted signal has been reflected (using the three receivers; see pages 20 – 21, figure 7).

Referring to claim 89, Oswald teaches the detecting means comprises switched sampling stages triggered from a common signal distributed via delay lines (see Abstract).

Referring to claim 90, Oswald teaches the frequency of the transmitted signal is between 0.5 and 77 GHz (see page 9 lines 1-4).

Referring to claim 91, Oswald teaches the frequency of the transmitted signal is one of approximately 6 GHz (see page 9 lines 1-4).

Referring to claim 92, Oswald is silent about the frequency of the transmitted signal is 2.45 GHz. However, using such frequency is well known and a wide range of frequency is used in many similar systems that include 2.45 GHz. Therefore, it would have been obvious to modify Oswald to include the 2.45 GHz transmit/frequency

depending on the range and noises in the system and clutter from other system and other similar factors for choosing a transmit frequency.

Referring to claim 101, Oswald teaches the positional information includes at least one of the range, azimuth and elevation of the object (see figure 7).

Referring to claims 102, 107, Oswald discloses in figure 4 a warning zone definition stage for defining a warning zone (entering regions of interest 34 and 36) within a detection field of the apparatus; and a discrimination stage for determining whether a detected object is within the warning zone; in which the warning zone is defined as a three-dimensional region within the detection field (inherent, using three or more receivers), wherein the warning zone is contained within and is smaller than the detection field of the apparatus 33 (see figure 4).

Referring to claim 103, Oswald teaches the radar system used in a vehicle (see figure 7).

Referring to claim 104, Oswald discloses in figure 7 the antenna array is adapted to be located on a fixed location on the vehicle.

Referring to claim 105, Oswald discloses in figure 7 the antenna array is adapted to be located within a component of the vehicle.

Referring to claim 106, Oswald discloses in figure 7 the antenna array is adapted to be located within a bumper of the vehicle.

Referring to claim 109, it's inherent that Oswald's system is capable of for obtaining information about object within or behind a wall (since the signals are radar signals which are able to penetrate different objects such as walls); furthermore, since

the system can detect multiple objects which might be locating one behind the other, it is inherent the radiation used can penetrate a wall and detect what's behind it.

Claims 65, 70, 73-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729 in view of Wu et al. US006493380B1 and Hane et al. WO 86/00716.

Referring to claim 65, Oswald as mentioned above teaches three sensing elements. Oswald is silent about teaching four receiving elements arranged non-collinearly. However, having more than three receivers is just a obvious to include to have more measurement and to obtain better measurements. Hane teaches the four receiving elements arranged non-collinearly (see figure 3). It would have been obvious to modify Oswald to include a fourth receiver to obtain even more measurements and to increase the accuracy.

Referring to claim 70, Oswald does not teach the receiving elements are arranged substantially at the vertices of a trapezial locus. Hane teaches the elements are arranged at the vertices of a trapezial locus (see figure 3). It would have been obvious to modify Oswald to include a fourth receiver to arrange the receiving elements at the vertices of a trapezial locus to obtain even more measurements and to increase the accuracy.

Referring to claim 73, Hane teaches the especial locus is rectangular (see figure 3). Hane teaches the four receiving elements arranged non-collinearly (see figure

3). It would have been obvious to modify Oswald to include a fourth receiver to obtain even more measurements and to increase the accuracy

Referring to claim 74, Hanes does not teach the trapezial locus is non-rectangular. However, arranging the four receivers so they are non-rectangular is well known and obvious and is a design chose. It would have been obvious to arrange the four receivers non-rectangular for design reasons or surface area reasons.

Claims 94-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729 in view of Wu et al. US006493380B1 and Kerry et al. WO 97/14058.

Referring to claim 94, Oswald does not teach means for applying a cross-correlation process to the returned probe signals. Kerry teaches cross-correlating the returned probe signals (see claim 7). It would have been obvious to modify Oswald's system to include cross-correlation of the returned signals for more accurate measurements and position determination.

Referring to claims 95 and 97, it's inherent that the cross-correlation process is a truncated cross-correlation process. Even if it is not inherent, truncated cross-correlation is well known and it would be obvious to include for fasted and more efficient processing.

Referring to claim 96, it's is inherent that the cross-correlation process is applied after a sampling Process.

Claims 110-112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729 in view of Wu et al. US006493380B1 and Chen et al. US. 6,326,915.

Referring to claim 110, Oswald does not teach means for providing an image of an environment in conditions that human vision is compromised. Chen teaches for providing an image of an environment in conditions that human vision is compromised (to view objects from located behind the car). It would have been obvious to modify Oswald's system to include the display system to provide the driver with a visual picture of the objects to avoid accidents.

Referring to claim 111, it's inherent that the display in Chen's system is operable when vision is compromised by the physiological condition of a user (not being able to look at the rear).

Referring to claim 112, it's inherent that Chen's system is operable when vision is compromised by environmental conditions. Even if it is not inherent that the display is operable when vision is compromised by environmental conditions such as rain or darkness. Display systems that are designs for darkness or other environmental conditions are well known; and it would be obvious to modify Oswald and Chen's system to include such display devices.

Allowable Subject Matter

Claims 63, 72, 78-83, and 116 are allowed.

Claims 69, 71, 75-77, 99-100 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 57-62, 64, 66-68, 85-93. 98, 101-107, 109 and 113-115 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isam Alsomiri whose telephone number is 571-272-6970. The examiner can normally be reached on Monday-Friday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isam Alsomiri

September 22, 2005

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